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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,080	01/16/2004	Gennadi Finkelshstein	P24757	5279
7055 7590 12/15/2008 GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191				
EXAMINER EICHELMAYER, ALIX ELIZABETH				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
12/15/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com  
pto@gbpatent.com

### Office Action Summary

**Application No.**

10/758,080

**Applicant(s)**

FINKELSHTEIN ET AL.

**Examiner**

Alix Elizabeth Echelmeyer

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 103-204 is/are pending in the application.
- 4a) Of the above claim(s) 133-136, 156-180 and 191-204 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 103-132, 137-155 and 181-190 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 1/14/08
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of the election of species requirement in the reply filed on August 27, 2008 is acknowledged. The traversal is on the ground(s) that the search and examination burden is not serious. This is not found persuasive because the two main species as claimed are mutually exclusive. Completely different searches would have to be carried out, since a search for a fuel cell where only one membrane is present will not overlap with a search for more than one membrane. If a fuel cell is taught having only one membrane, then it would not necessarily teach multiple membranes, and the search for both single and multiple membranes is highly burdensome for the examiner, especially because there are so many limitations to the membrane that already require a large search.

The requirement is still deemed proper and is therefore made FINAL.

***Drawings***

2. The objection to the drawings is withdrawn.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 103-109, 112-118 and 137-144 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. (US 2003/0059660) in view of Mehl et al. (US 3,911,080).

Kamo et al. teach a fuel cell having vent holes on the outer container (abstract).

The vent holes of Kamo et al. allow for the escape of gas formed during the operation of the fuel cell. The vent is impermeable to liquid. (Figure 4A, [0049]).

The vent holes contain a porous gas/liquid separation membrane that is permeable to gas but impermeable to liquid ([0050]).

As for claim 104, the membrane is made of polytetrafluoroethylene, which is hydrophobic ([0125]).

With regard to claims 113, 114, 137-139, 141, it is disclosed in the instant specification that the membrane material of Kamo et al., polytetrafluoroethylene, would inherently have a surface energy of not more than 8 dynes/cm (see [0052] of US 2005/0158609).

Kamo et al. teach a porous gas/liquid separation membrane that allows the passage of gas but not liquid.

As for claims 107-109, 140, the membrane of Kamo et al. is made from the same material as the membrane of the instant invention, polytetrafluoroethylene.

As for claims 105 and 106, since the membrane Kamo et al. is made of the same material and serves the same purpose as the instant membrane, one of ordinary skill in

the art would recognize that the membrane of Kamo et al. would inherently have the same porosity and thickness as the instant membrane, since those limitations would be required for the membrane to function in the same way.

Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the porous membrane of Kamo et al. with sufficient thickness and porosity to serve the function required, specifically to allow for the passage of gas but restrict the passage of liquid.

Kamo et al. teach a fuel cell having a membrane comprising a fluorine-containing polyolefin but fail to teach a coating on the membrane.

Witzko et al. teach a thin film hydrophobic polymer membrane with a surface coating (abstract, column 1- lines 27-34).

The coating of Witzko et al. is made of a perfluorocarboxylic acid having the formula  $\text{CF}_3(\text{CF}_2)_n\text{--}$ , where  $n \geq 6$  (column 2 lines 40-44).

With further regard to claim 103 and regarding claim 112, since the membrane and coating meet the limitations required for the instant invention, the coating would inherently have lower surface energy than the porous membrane.

As for claims 115, 142, when  $n=7$ , the group contains 17 fluorine atoms.

With regard to claims 116-118, 143, 144, when  $n=7$ , the group contains 8 carbon atoms.

Witzko et al. further teach that the coating provides good chemical and mechanical stability and a permanent finish (column 2 lines 11-15).

It would be advantageous to use the coating of Witzko et al. on the membrane of Kamo et al. since the coating provides good chemical and mechanical stability and a permanent finish.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to the coating provides good chemical and mechanical stability and a permanent finish.

5. Claims 110, 111, 120-124, 126-132, 146-148 and 150-155 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. in view of Witzko et al. as applied to claims 103, 107 and 137 above, and further in view of Mehl et al. (US 3,911,080).

The teachings of Kamo et al. and Witzko et al. as discussed above are incorporated herein.

Kamo et al. teach a porous gas/liquid separation membrane for a fuel cell but fail to teach an inorganic component such as activated carbon in the membrane.

Mehl et al. teach a liquid-impermeable gas-permeable membrane (abstract).

Mehl et al. further teach the addition to the membrane of an inorganic powder for absorbing pollutants in the gas that passes through the membrane (column 3 lines 26-40).

The powder may be alumina, and is preferably activated carbon in a polytetrafluoroethylene matrix (column 3 lines 32-33, 39-40).

As for claims 120-124, 146-148, 155, since the membrane Kamo et al. in view of Witzko et al. and Mehl et al. is made of the same material and serves the same purpose as the instant membrane, one of ordinary skill in the art would recognize that the membrane of Kamo et al. in view of Witzko et al. and Mehl et al. would inherently have the same porosity and thickness as the instant membrane, since those limitations would be required for the membrane to function in the same way. Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the porous membrane of Kamo et al. in view of Witzko et al. and Mehl et al. with sufficient thickness and porosity to serve the function required, specifically to allow for the passage of gas but restrict the passage of liquid.

Regarding claims 126-132 and claims 150-155, Applicant is reminded of the teachings of Witzko et al. as discussed above.

6. Claims 119 and 145 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. in view of Witzko et al. as applied to claims 115 and 144 above, and further in view of Hayadashida et al. (US 5,403,483).

The teachings of Kamo et al. in view of Witzko et al. as discussed above are incorporated herein.

Kamo et al. in view of Witzko et al. fail to teach that the coating comprises perfluorooctyl methacrylate.

Hayadashida et al. teach a coating for a hydrophobic porous membrane comprising perfluorooctyl methacrylate (column 9 lines 22-24).

Hayadashida et al. further teach that the perfluorooctyl methacrylate helps to increase the strength and hydrophobicity of the membrane (column 2 lines 29-35).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include perfluorooctyl methacrylate in the membrane to increase the strength and hydrophobicity of the membrane.

7. Claims 125, 149, 181-184 and 187-193 rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al., Witzko et al., and Mehl et al. as applied to claims 120 and 148 above, and further in view of Troczynski et al. (US 2002/0107133).

The teachings of Kamo et al., Witzko et al. and Mehl et al. as discussed above are incorporated herein.

As for claim 187, the membrane is made of polytetrafluoroethylene, which is hydrophobic ([0125]).

Regarding claim 188, the membrane of Kamo et al. is made from the same material as the membrane of the instant invention, polytetrafluoroethylene.

Concerning claim 189, it is disclosed in the instant specification that the membrane material of Kamo et al., polytetrafluoroethylene, would inherently have a surface energy of not more than 8 dynes/cm (see [0052] of US 2005/0158609).



As for claims 190 and 193, in the coating of Witzko et al., when  $n=7$ , the group contains 17 fluorine atoms and the group contains 8 carbon atoms.

With regard to claims 191 and 192, Mehl et al. further teach the addition to the membrane of an inorganic powder for absorbing pollutants in the gas that passes through the membrane (column 3 lines 26-40). The powder may be alumina, and is preferably activated carbon in a polytetrafluoroethylene matrix (column 3 lines 32-33, 39-40). Since the membrane Kamo et al. in view of Witzko et al. and Mehl et al. is made of the same material and serves the same purpose as the instant membrane, one of ordinary skill in the art would recognize that the membrane of Kamo et al. in view of Witzko et al. and Mehl et al. would inherently have the same porosity and thickness as the instant membrane, since those limitations would be required for the membrane to function in the same way. Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the porous membrane of Kamo et al. in view of Witzko et al. and Mehl et al. with sufficient thickness and porosity to serve the function required, specifically to allow for the passage of gas but restrict the passage of liquid.

As for claims 125, 149 and 181-184, Kamo et al. in view of Witzko et al. and Mehl et al. fail to teach a stainless steel component, or reinforcing mesh, in the membrane.

Troczyński et al. teach the use of a stainless steel mesh in membranes for increasing the strength of the membrane ([0058]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a stainless steel mesh support such as taught by Troczynski et al. in the membrane of Kamo et al. in view of Witzko et al. and Mehl et al. in order to provide more strength to the membrane.

8. Claims 185 and 186 rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al., Witzko et al., Mehl et al. and Troczynski et al. as applied to claim 183 above, and further in view of Abe et al. (US 4,529,793).

The teachings of Kamo et al., Witzko et al., Mehl et al. and Troczynski et al. as discussed above are incorporated herein.

Kamo et al. in view of Witzko et al., Mehl et al. and Troczynski et al. fail to teach that the mesh comprises polypropylene.

Abe et al. teach a membrane substrate of polypropylene (column 9 lines 9-24).

One of ordinary skill in the art would recognize possible advantages of using polypropylene instead of stainless steel in the membrane of Kamo et al. in view of Witzko et al., Mehl et al. and Troczynski et al., such as polypropylene's resistance to substances which may corrode a stainless steel membrane.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use polypropylene instead of stainless steel to provide better corrosion resistance.

***Response to Arguments***

9. Applicant's arguments have been considered but are moot in view of the new grounds of rejection, see above. The new rejection was necessitated by the amendment.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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